

Monthly Marine Biotoxin Report

March 2007

Technical Report No. 07-15

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of March, 2007. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

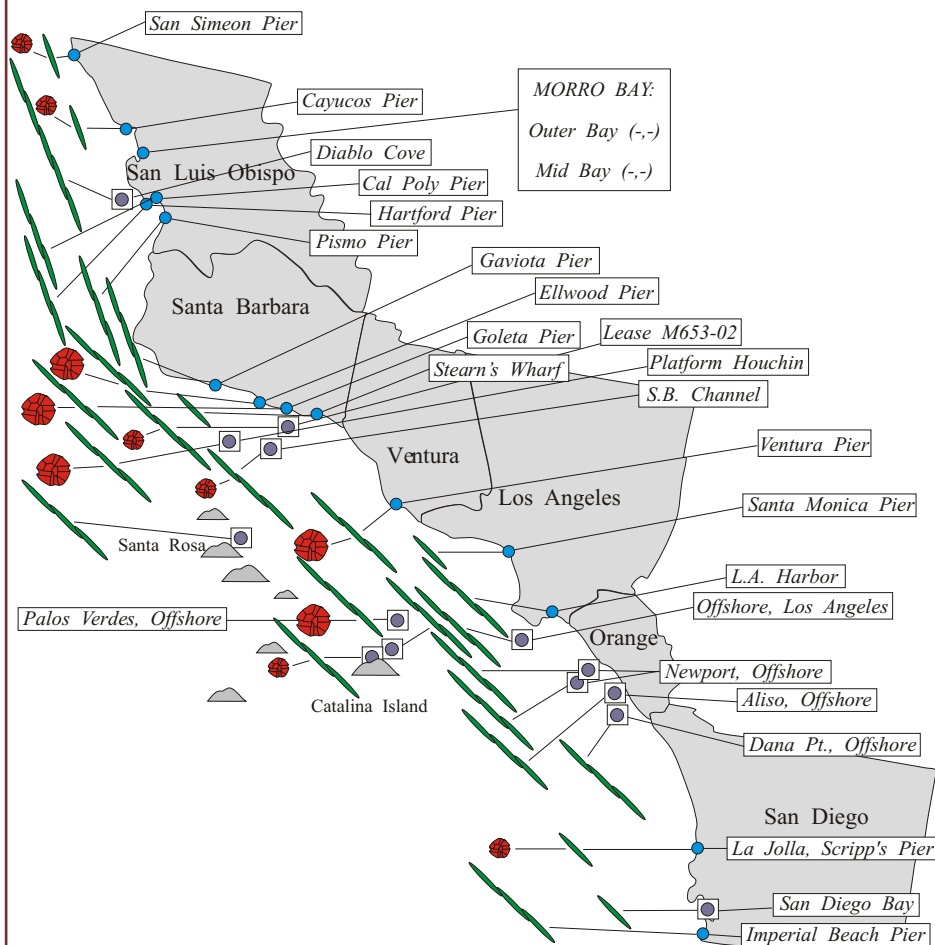
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sites between San Luis Obispo and San Diego counties during March (Figure 1). The distribution of this

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during March, 2007.



Relative Abundance of Known Toxin Producers

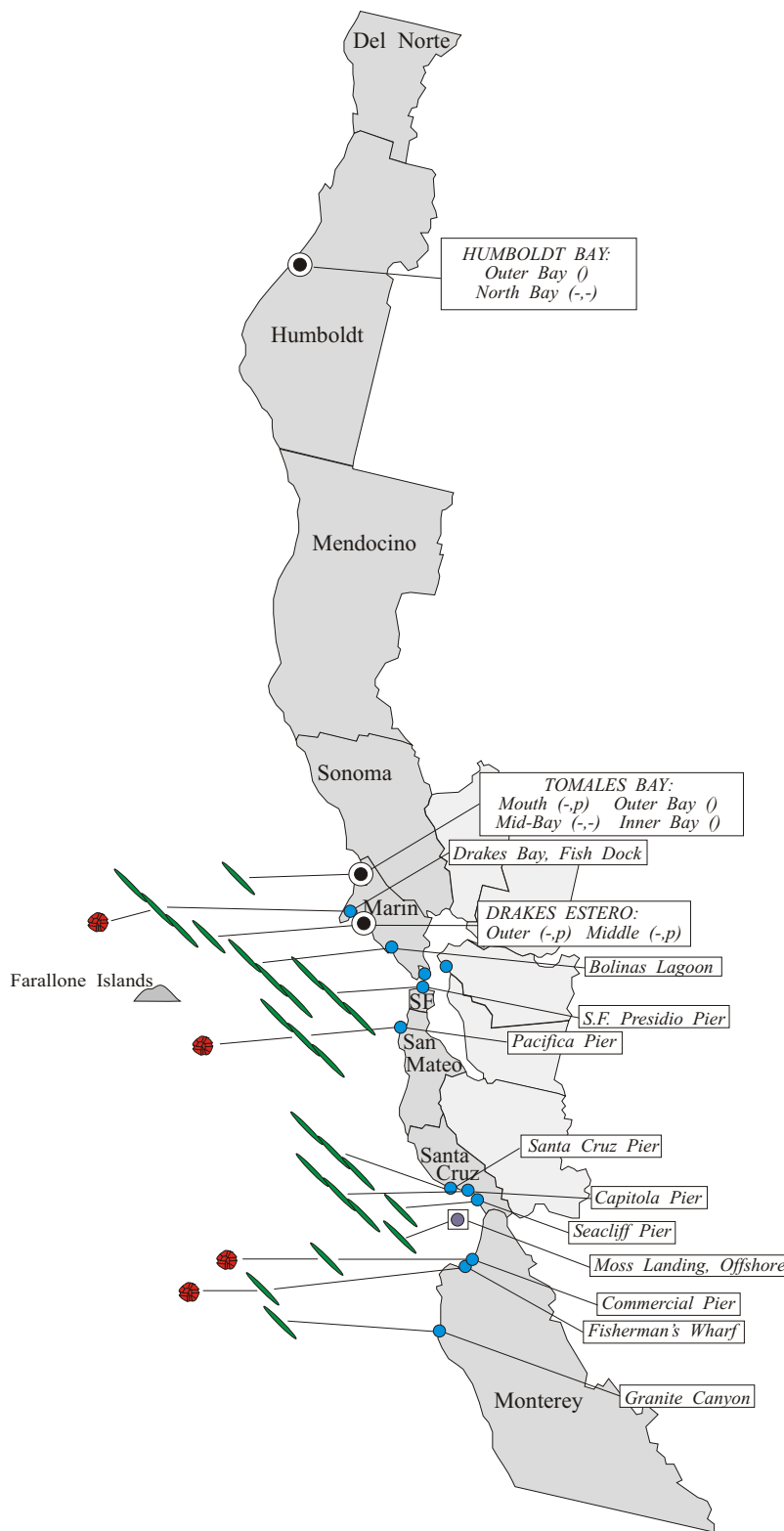
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during March, 2007.



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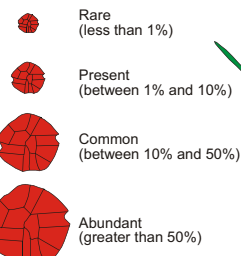
dinoflagellate was similar to observations in February. The relative abundance was reduced at sites in San Luis Obispo County but increased along the Santa Barbara coast. *Alexandrium* was observed offshore near Santa Rosa and Catalina islands and off of the Palos Verdes peninsula (Los Angeles County) as well. This marks the 13th consecutive month that *Alexandrium* has been observed along a significant portion of the Southern California coast.

PSP toxicity decline below the detection limit in mussel samples along the San Luis Obispo coast as *Alexandrium* disappeared from this region (Figure 3). Low levels of these toxins were detected in mussels at Goleta Pier throughout the month. There was another sudden increase in PSP toxicity in mussels from an aquaculture lease offshore of Santa Barbara during the second week of March. Within one week the toxin concentration in mussels increased from nondetectable levels (March 6) to above the alert level (87 ug/100g on March 14). PSP toxin concentration reached 99 ug by March 21 before declining at the end of the month. Low levels of the PSP toxins were also detected in mussels from Los Angeles and San Diego counties, as well as in a sample of lobster viscera collected near Santa Cruz Island on March 5.

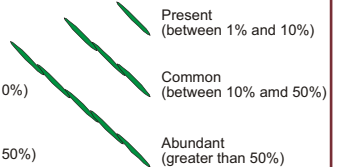
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



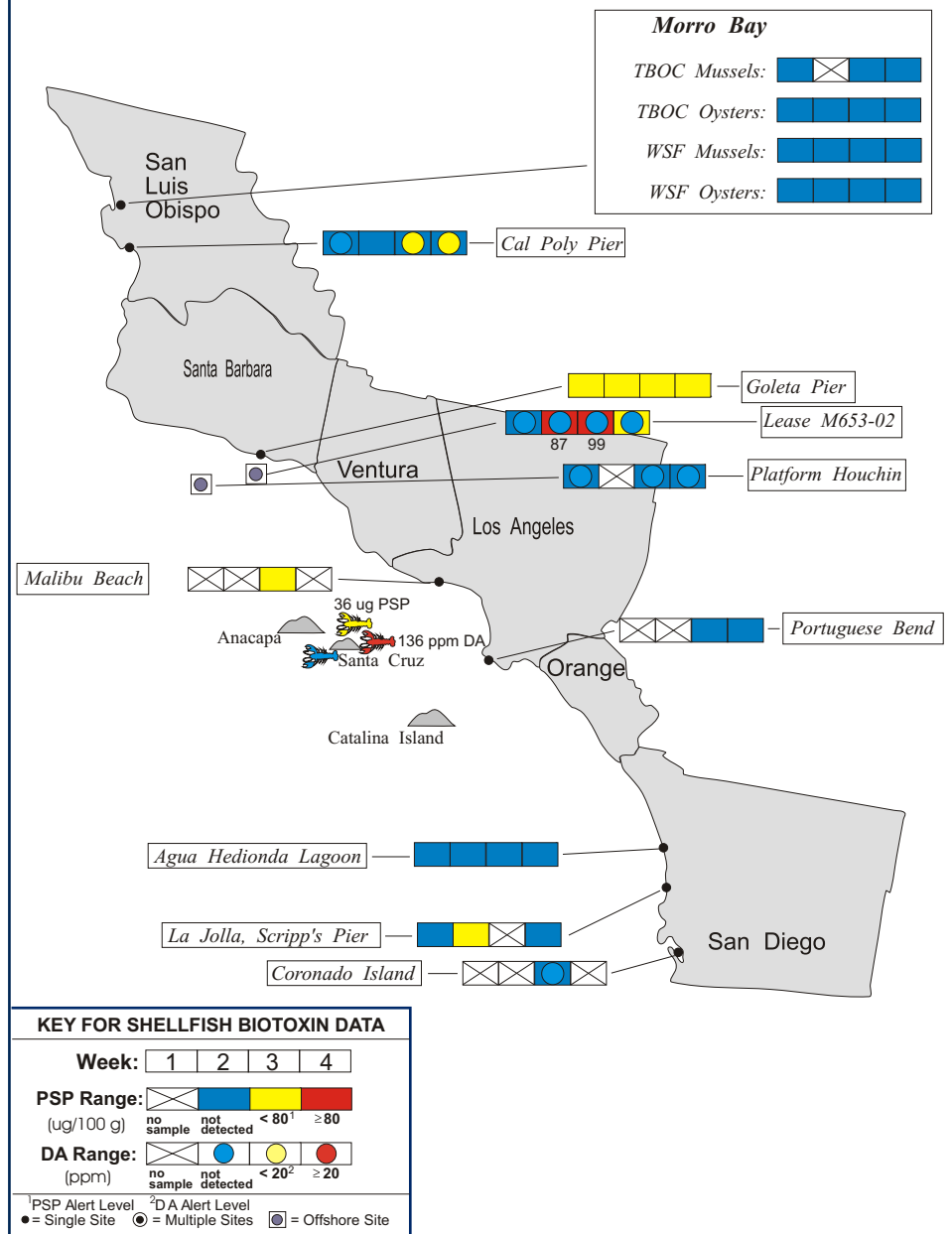
MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during March, 2007.



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Domoic Acid

Pseudo-nitzschia continued to be observed along the entire Southern California coast in March (Figure 1). The distribution was similar to observations in February, although there was a significant increase in the relative abundance along much of coast. Numbers of this diatom steadily increased throughout the month along the San Luis Obispo coast. The highest relative abundances were observed offshore of Diablo Cove (March 20), followed by lower but significant levels at Avila (March 27) and Imperial Beach (March 13). Cell numbers of *Pseudo-nitzschia* also increased through mid-March at Imperial Beach (San Diego County).

Low levels of domoic acid were detected in mussel samples from Avila during the last two weeks of March, increasing from 3 ppm on March 20 to 14 ppm by March 27 (Figure 3). A high concentration of this toxin (136 ppm) was detected in a sample of lobster viscera from Santa Cruz Island (March 5).

Non-toxic Species

Diatoms dominated the Southern California coast, although several dinoflagellates were well represented at some San Diego sites. A tremendous bloom of *Chaetoceros*

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

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(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

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was observed along the San Luis Obispo coast by mid-March, with cell densities that were orders of magnitude greater than at any other region. *Lauderia*, *Skeletonema*, *Thalassiosira*, and *Rhizosolenia* were also common. *Cochlodinium* was common at sites in Santa Barbara and Los Angeles counties and offshore near Catalina Island.

Northern California Summary:

Paralytic Shellfish Poisoning

The distribution and relative abundance of *Alexandrium* declined slightly in March compared to observations in February (Figure 2).

The low levels of PSP toxins detected in sentinel mussels from Drakes Estero throughout February persisted at only one site through the first week of March (Figure 4). Low levels of these toxins were detected throughout March in sentinel mussels from the Santa Cruz Pier.

Domoic Acid

The distribution of *Pseudo-nitzschia* increased noticeably in March between Marin and Santa Cruz (Figure 2). Domoic acid was not detected in any shellfish samples collected in March.

Non-toxic Species

Diatoms dominated the Northern California coast, with *Chaetoceros*, *Skeletonema*, and *Thalassiosira* the most common species. The dinoflagellate *Prorocentrum* remained common at sites inside Monterey Bay.



QUARANTINES:

There were no quarantines in effect in March. The annual mussel quarantine

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Figure 4. Distribution of shellfish biotoxins in Northern California during March, 2007.

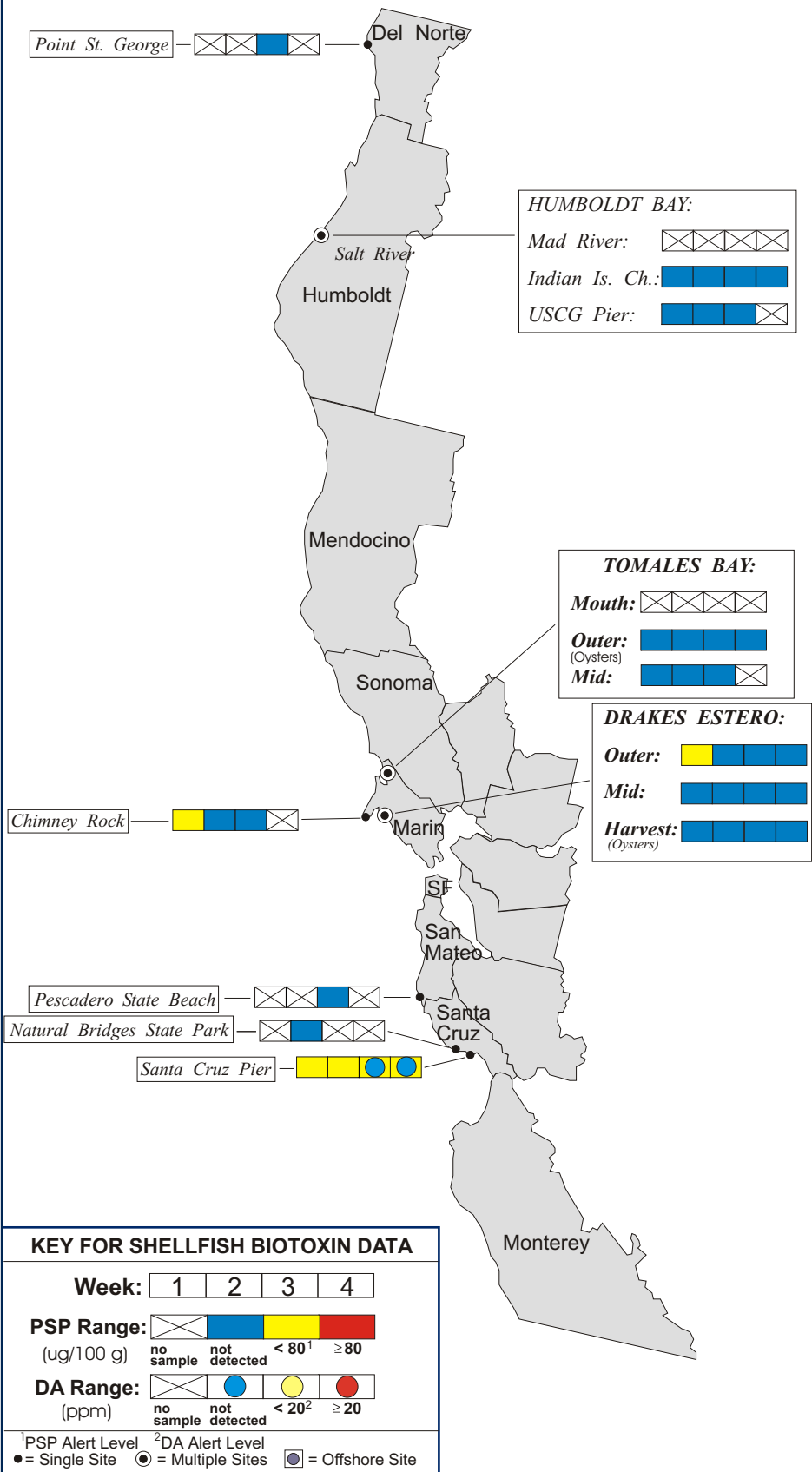


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during March, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	7
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	CDHS Marine Biotoxin Monitoring Program	6
	Marin Oyster Company	1
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Cal Poly	4
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	8
Santa Barbara	Central Coast Shellfish Company	4
	Santa Barbara Mariculture Company	9
	U.C. Santa Barbara	5
Ventura	CDHS Volunteer (Bill Weinerth)	3
Los Angeles	Los Angeles County Health Department	5
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	3
	CDHS Volunteer (Steve Crooke)	1

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normally goes into effect on May 1 of each year and applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. Routine biotoxin monitoring is maintained throughout this period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

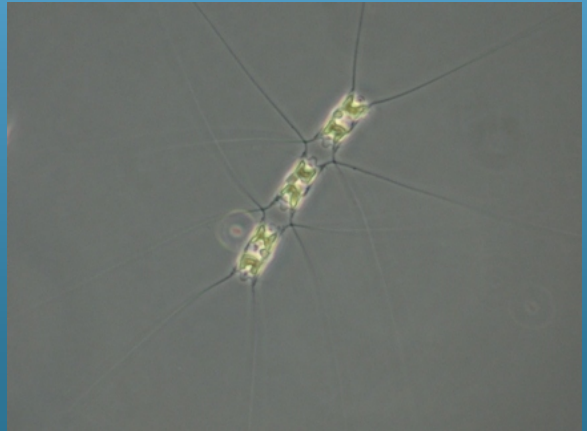
Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport-harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



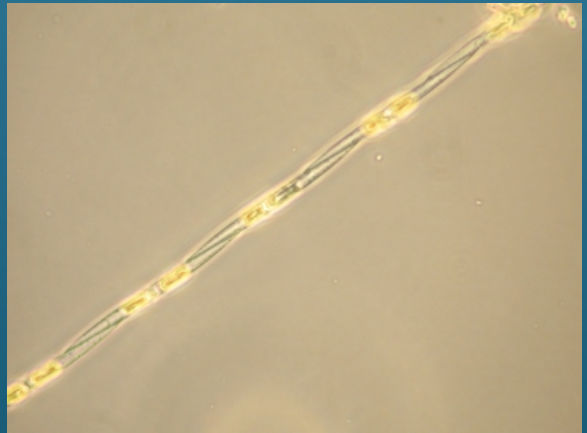
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during March, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Audubon California	2
	CDHS Volunteers (Brent Anderson, Cal	6
	Drakes Bay Oyster Company	8
	CDHS Marine Biotoxin Monitoring Program	5
San Francisco	CDHS Volunteer (Eugenia McNaughton)	2
San Mateo	San Mateo County Environmental Health	2
	The Marine Mammal Center (Stan Jensen)	4
Santa Cruz	The Marine Mammal Center (Nancy	2
	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health	3
Monterey	Monterey Abalone Company	2
	The Marine Mammal Center (Aubrey St.	1
	Marine Pollution Studies Laboratory	4
	Marine Life Studies	1
San Luis	CDHS Volunteer (Renee and Auburn Atkins)	2
	Cal Poly	5
	Monterey Bay National Marine Sanctuary	2
	Morro Bay National Estuary Program	2
	Tenera Environmental	2
	The Marine Mammal Center (Debbie Davis,	4
Santa Barbara	Central Coast Shellfish Company	3
	CDHS Volunteer (Sylvia Short)	3
	Channel Islands National Marine Sanctuary	1
	CDHS Marine Biotoxin Monitoring Program	3
	National Park Service	3
	Santa Barbara Channel Keeper	2
	Santa Barbara Mariculture Company	3
	U.C. Santa Barbara	5
Ventura	CDHS Volunteer (Fred Burgess)	3
Los Angeles	Los Angeles County Health Department	1
	Los Angeles County Sanitation District	4
	Guided Discoveries, Tole Mour	9
	Southern California Marine Institute	1
Orange	Ocean Institute	1
	Orange County Sanitation District	2
San Diego	Avian Research Associates	3
	CDHS Volunteer (Paul Sims, Claire Sims)	3
	Scripps Institute of Oceanography	4

PHYTOPLANKTON GALLERY



Several species of the diatom *Chaetoceros* were common or abundant along the California coast.



Pseudo-nitzschia, the diatom that produces domoic acid, increased significantly in numbers throughout the month.



Although diatoms dominated the California coast, a few dinoflagellates such as *Dinophysis caudata* were also present.